

BWSC's Clean Energy Results Program

Clean Energy/Climate Adaptation Updates

Waste Site Cleanup Advisory Committee Meeting
Thursday, March 23, 2017

Thomas M. Potter
Clean Energy Development Coordinator



AGENDA

1. Greener Cleanups
Leadership
Recognition
2. Climate Change
Adaptation/BU Study



Shaffer Landfill, Billerica

Greener Cleanup Leadership Recognition Program

Greener Cleanups Leadership Recognition *Incentive* Program

“MassDEP will recognize *the* person(s), entity, or project that demonstrates professional performance in applying Greener Cleanup principles and practices to reduce the overall net environmental footprint of response actions implemented under the Massachusetts Contingency Plan. Greener Cleanups aim to eliminate or reduce *total energy use, air pollutant emissions, greenhouse gases, water use, materials consumption, and ecosystem and water resources impacts related to the assessment and cleanup of a disposal site.*”

Eligibility & Consideration

- **FY2017 Recognition: Response action submittals filed between June 30, 2016 and June 30, 2017.**
- Any response action submittal completed in accordance with applicable requirements of the MCP in consideration of the “Greener Cleanup” core elements prescribed at 310 CMR 40.0191 and, as applicable, at 310 CMR 40.0858.
- Primary focus will be on:
 - MCP regulatory compliance and “Greener Cleanups Guidance”
 - Identification, prioritization, selection, implementation and documentation of feasible ASTM’s Best Management Practices (BMPs), and/or other technical equivalent.
- Internal BWSC Review Team - screened and scored universe.

ROBERTS CONSULTING, INC.



SOVEREIGN CONSULTING INC.

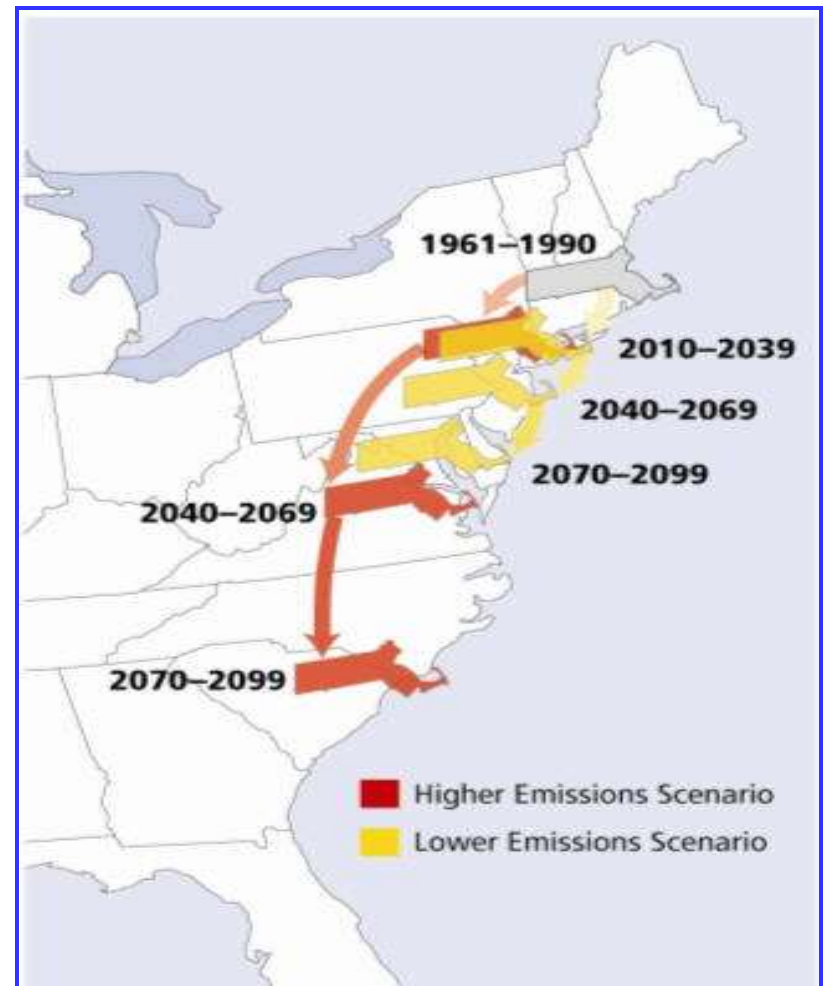


2016 Recognition

- **Donald Podsen, LSP** Brown & Caldwell, and
City of Medford
At 448 High Street Site in Medford
- **J. Andrew Irwin, PE, LSP**, IRWIN Engineers in Natick, and
Brownfields Real Estate Development LLC
At 129 Concord Road, Billerica
- **David Austin, LSP**, AECOM, and
Pentair
At Former Tyco Valves & Controls, Wrentham
- **Matthew Hackman, LSP**, Matthew Hackman, PE, CHMM, Inc.
(Stewardship)



Climate Change and Resilience within Assessment & Remediation

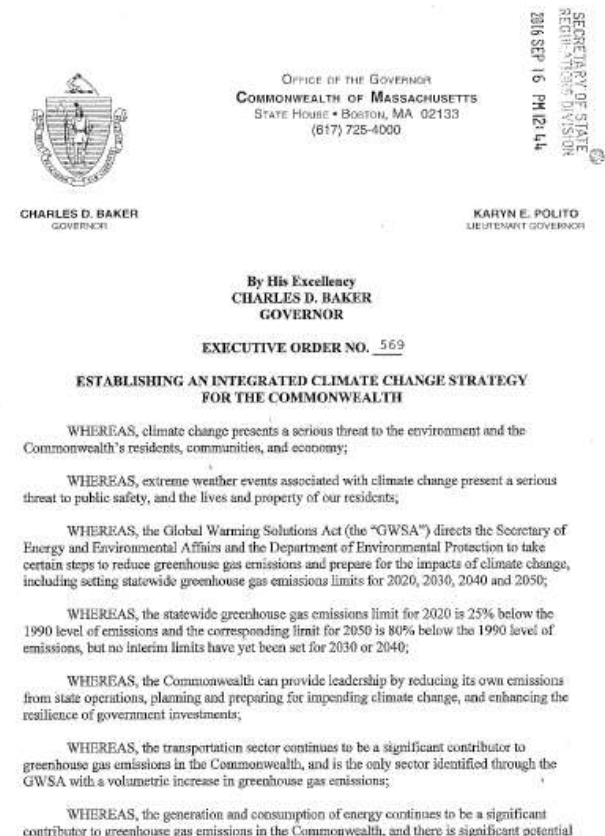


Source: NECIA/UCS, 2007 (see: www.climatechoices.org/ne/)

2016 Governor's Executive Order No. 569

<http://www.mass.gov/governor/legislationexecorder/execorders/executive-order-no-569.html>

- **September 16, 2016**
- “Establishing An Integrated Climate Change Strategy For The Commonwealth”
- “Climate Change presents a serious threat to the environment and the Commonwealth’s residents, communities, and economy”
- “Extreme weather events associated with climate change present a serious threat to public safety, and the lives and property of our residents”



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Within Assessment & Remediation

Mitigation and Adaptation for OHM Sites

Mitigation (Implemented)

- Through **Green and Sustainable Remediation practices**, we seek to reduce GHG emissions of assessment and remediation of OHM at sites.

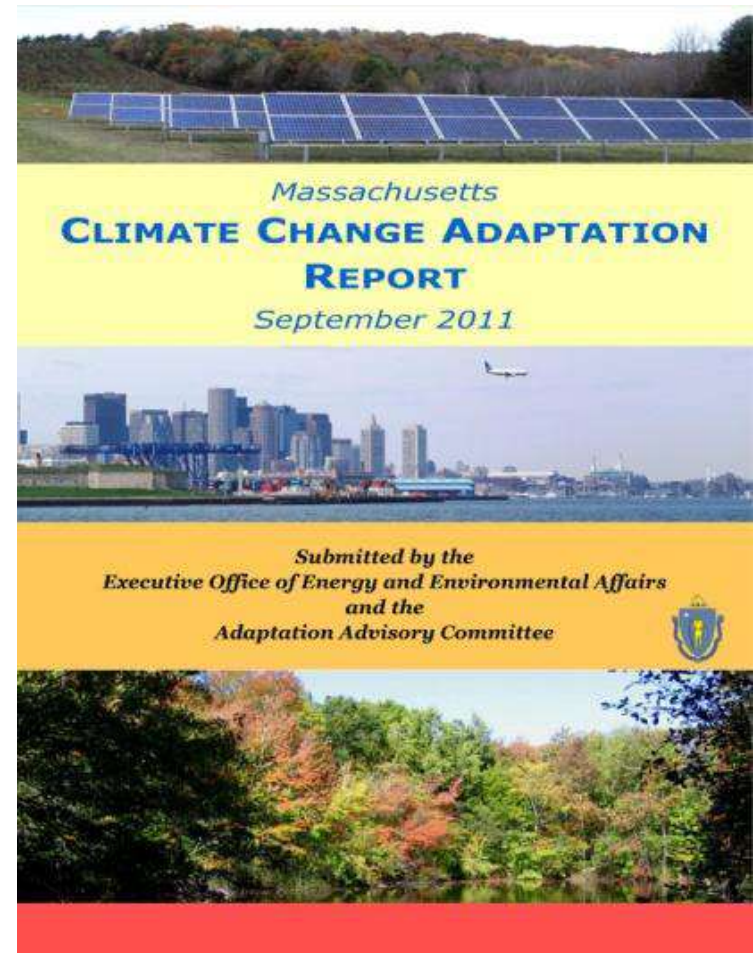
Adaptation (ongoing)

- Through **adaptation**, we seek to ensure OHM site **remedy resilience** in the face of climate change impacts specific to the Northeast.

2011 Climate Change Adaptation Report

Impacts & Vulnerabilities

- **Sea Level Rise and Flooding**
 - Coastal inundation and storm surges
 - Property damage and loss of natural habitats
 - Interruption of key services
- **Extreme Weather**
 - High winds, hurricanes, storm surges, waves, ice storms, flooding
 - Reduced emergency response capacity
- **Precipitation**
 - Decreased summer, increased winter precipitation
 - Less spring snow melt and earlier peak streamflow
 - Current 100-year flood every 2-3 years by 2100
 - Extended low-flow periods, decreased summer water supply
- **Temperature**
 - Higher temps, more extreme heat



USEPA Superfund Analysis

- ◆ Goal: Climate change vulnerability analysis across our most common remedies (portfolio analysis)
 - Developed matrix of remedy sensitivity to climate change
 - Rated relative vulnerability of individual remedies to climate change scenarios
- ◆ Screened frequent and potentially vulnerable remedies
 - GIS plot of remedies based on site lat-long coordinates
 - Focus on subset of higher vulnerability and frequent remedies

Focus on Pump and Treat and containment remedies at sites due to high infrastructure costs, presence of physical plant, long operating life and high number of remedies. Containment remedies have remaining contaminants that could be mobilized.

Source: USEPA, 4/1/15

Remedy Vulnerability to Climate Change

Common Remedy Types*	Climate Change Scenarios							
	Flooding (Event)	Inundation (Chronic)	Extreme Storms	Large Snowfall	Wild Fires	Drought	Extreme Heat	Landslide (Precip)
Source In Situ								
SVE								
Solidification/Stabilization*								
In Situ Thermal Treatment								
Multi-phase Extraction								
Bioremediation								
Source Ex Situ								
Solidification/Stabilization*								
Physical Separation								
Recycling								
Surface Water Treatment								
Unspecified Off Site Treatment								
On-site Containment								
Groundwater In Situ								
Bioremediation								
Chemical Treatment								
Air Sparging								
Permeable Reactive Barrier								
Groundwater Ex Situ								
P&T								
Vertical Engineered Barrier								
Monitored Natural Attenuation								

Qualitative Vulnerability Analysis

* Most common remedy types based on Superfund Remedy Report

- No known potential impacts
- Minor impacts: Potential for temporary loss of remedy functionality or effectiveness, contaminant(s) remain contained
- Moderate impacts: Potential for total loss of remedy functionality and effectiveness indefinitely, contaminant(s) remain contained
- Major impacts: Potential for total loss of remedy functionality and effectiveness indefinitely, contaminant(s) release

Source: USEPA, 4/1/15

MassDEP “Adaptation” Efforts (2016 - ?)

- Reviewing current statutes, regulations and policies
 - *Reasonably Foreseeable Uses*
 - *Remedial Action Alternatives*
- Evaluating our universe of regulated sites and their vulnerability to climate change impacts
 - “Open” sites
 - Active Remedial Systems
 - Engineered Barriers
 - Institutional Controls (e.g. AULs)
- Engaging stakeholders

Boston University *Independent Study* **Climate Change/Global Warming** **Adaptation Project**

Fall 2016

Rick Reibstein, *Lecturer*,
Department of Earth and Environment
Boston University

Boston University *Independent Study*

1. Research and understanding of available authoritative resources (e.g. MassDEP, USEPA & FEMA) on climate change scenarios/impacts (e.g. Flooding, Inundation, Extreme Storms (surge), Large Snowfall, Wildfires, Drought, Extreme Heat, Landslides (precipitation))



Plotting Sites near or within 100 & 500 year floodplains (source: USEPA, 4/1/15)

Boston University Independent Study (cont.)

2. Conduct a statewide assessment of regulated sites and their vulnerability to climate change impacts
 - “Open” sites
 - Active Remedial Systems
3. Evaluate adaptation measures available and applicable to address vulnerabilities and increase remedy resilience including available incentive programs (e.g. DOER’s resiliency program)



Plotting Sites near or within 100 & 500 year floodplains (source: USEPA, 4/1/15)

“Hazardous Waste Site Vulnerability Assessment”

Fall 2016

By Katelyn Tarrio

(with help Antonio Chidiac)

Boston University

Climate Change Resources

Massachusetts Executive Office of Energy and Environmental Affairs – Climate Change Adaptation

- <http://www.mass.gov/eea/waste-mgmt-recycling/air-quality/climate-change-adaptation/>

Governor's Executive Order No. 569

- <http://www.mass.gov/governor/press-office/press-releases/fy2017/gov-baker-signs-climate-change-strategy-executive-order.html>

MassDEP Climate & Clean Energy

- <http://www.mass.gov/eea/agencies/massdep/climate-energy/climate/>

Department of Energy Resources – Climate Resiliency

- <http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/resiliency/resiliency-initiative.html>

U.S. Environmental Protection Agency – Superfund Climate Change Adaptation

- <https://www.epa.gov/superfund/superfund-climate-change-adaptation>
 - Climate Change Adaptation Technical Fact Sheet: Groundwater Remediation Systems <https://semspub.epa.gov/work/11/175851.pdf>

Thank You!

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Clean Energy Results Program Website:

<http://www.mass.gov/eea/agencies/massdep/climate-energy/>